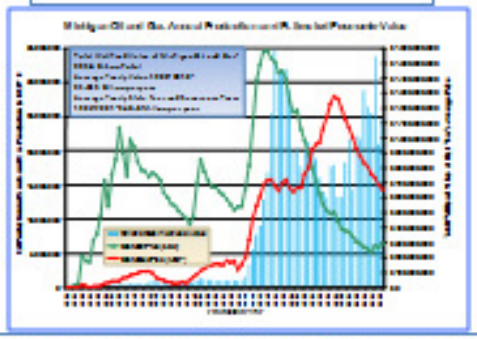
Michigan Energy Issues – Petroleum and Natural Gas

Additional Opportunities for Petroleum and Natural Gas

Michigan Historic Oil and Gas Production from 1920 to 2012
1.3 Billion barrels oil and
7.7 Trillion Cubic feet Natural Gas

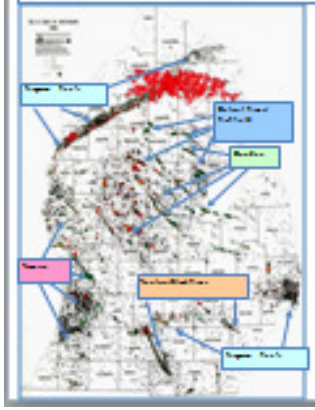


Enhanced Oil Recovery
BENEFITS: Known oil in place, often with existing infrastructure
Adequate resources to evaluate recovery potential. Good local market.
ISSUES: Primary recovery in fields less than 30% of original oil in place.
Historic secondary recovery can gain an additional 15 to 30% of OOIP

Michigan Petroleum and Natural Gas Consumption
2010 Total Petroleum - 138.2 million bbls
2010 Total Natural Gas – 743.5 Billion Cubic ft
Michigan Produces: 2.3% of total U.S. Oil (2010) and 3.1% of total U.S. Natural Gas(2010)
Michigan Produces: 4.9 % of the Oil and 18.6 % of the Natural Gas it consumes

Michigan Underground Natural Gas Storage
Largest total and working capacity in U.S
60 currently active storage fields
1.19 TCF Natural Gas total storage capacity
710 BCF Working capacity
485 BCF Base gas

Michigan Historic Oil and Gas Well Locations
1,186 – Brine disposal wells
807 – Water injection wells
3866 – Gas storage and observation wells
13,414 – Natural Gas wells
14,304 – Oil Wells



2010 Wellhead Value of Michigan Oil and Gas
Oil - $536,575,236 Gas - $591,134,901

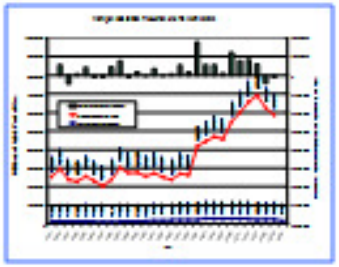
Michigan's Top 250 Niagaran Reef Fields

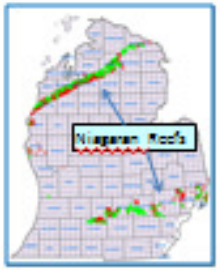
- Cumulative production of
  - 405 million bbls oil (about 82% of total production)
  - 1.34 TCF gas (about 46% of total production)
  - 628 million BOE
- Primary recovery average - 26.6%
- Enhanced recovery average - 12.1% (65 fields)
- Estimated original hydrocarbon in place
  - 1.5 billion barrels oil
  - 3.2 TCF gas
- Potential EOR @ 12.1% recovery of OOIP – 180 MMbbls

Core Energy CO2 EOR Operations in Otsego Co., Michigan

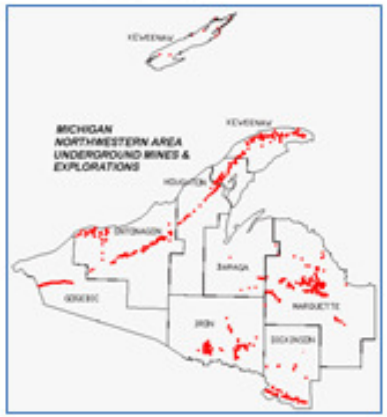
CO2 EOR has recovered more than 1.5 million additional barrels of oil

Potential Additional Gas Storage Fields
About 2/3 of current storage fields are in Silurian Niagaran Pinnacle reefs. Providing 560 BCF High Quality storage capacity.
100 Niagaran Reef Fields have historically produced more than 10 BCF of Gas each. Only 41 are currently used for gas storage.
The additional 60 fields could provide over 1.0 TCF additional storage capacity





Michigan's Mineral Resources - Metallic and Non-Metallic



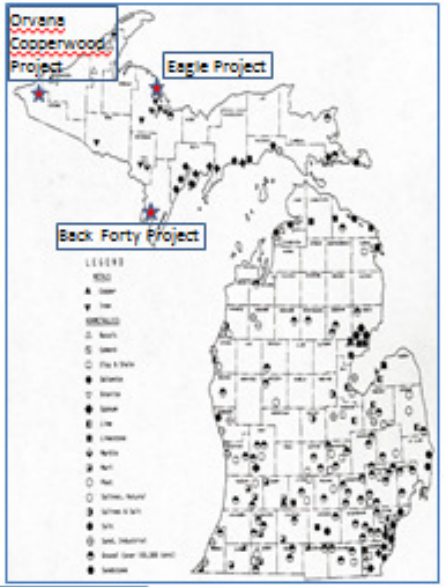
http://www.mg.mtu.edu/abmine/mtrg.htm

Major Regions of Mineral Production

Western Upper Peninsula- PreCambrian Rocks, mainly metallic minerals, including Iron Ore, Copper, Nickel, Silver, Gold, and Platinum Group Elements

Lower Peninsula and Eastern Upper Peninsula - Paleozoic bedrock and deeper Subsurface, non-metallic, industrial minerals, Including limestone, dolomite, gypsum, salt and potash

Entire State – Surface and near-surface Pleistocene glacial deposits and bedrock primarily for aggregate uses, including Industrial Sand, crushed stone, concrete aggregate



Michigan Minerals Production

(2008 Statistics, most recent available)

Total Value - $1.99 Billion

Percent of total U.S. Production – 2.8%

Rank among 50 states in Mineral value – 12th

Metallic Minerals

Iron Ore – 12.4 million metric tons – 2nd in the U.S.

Nickel and copper mining being developed

Industrial Minerals

Portland cement – $502 million

Masonry cement - $12 million

Construction sand and gravel - $208 million

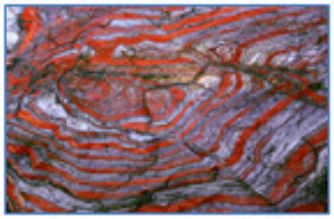
Industrial sand and gravel - $ 26.8 million

Crushed stone – $101 million

Crude Gypsum - $7.3 million

Common clays – $1.7 million

Combined value of bromine, lime, magnesium compounds, potash, salt - $1.13 billion



Banded Iron Formation-
Source of Michigan Iron ore greatest value of any Michigan mineral product

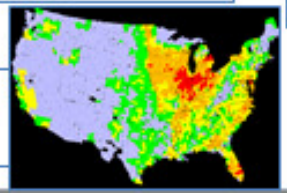
Hersey Mine Solution Salt and Potash Mine
Produces Industrial Salt and Potash for Fertilizer

Deep Underground Salt Mine
Bedded salt layers mined for deicing application and other industrial uses
Salt and related compounds also solution mined from deep wells

Surface Glacial Deposits
Primary source of industrial and construction sand and gravel

Michigan Native Copper -
Historically important metallic Mineral.
No current active mining, but good future mining opportunities in Western U.P.

Eagle Mine in Michigan U.P.
Very High quality Nickel, Copper and Platinum Group Elements



U.S. Potash Demand for Fertilizer
Potash demand is over 4 million tons per year in upper Midwest